

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
7 February 2002 (07.02.2002)

PCT

(10) International Publication Number  
WO 02/09669 A3

(51) International Patent Classification: A61K 9/16, 9/00

(21) International Application Number: PCT/US01/23937

(22) International Filing Date: 30 July 2001 (30.07.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/222,067 1 August 2000 (01.08.2000) US

(71) Applicant: INHALE THERAPEUTIC SYSTEMS, INC. [US/US]; 150 Industrial Road, San Carlos, CA 94070 (US).

(72) Inventors: SNYDER, Herm; 627 Big Bend, Belmont, CA 94002 (US). SMITH, Adrian, E.; 2803 Alhambra Drive, Belmont, CA 94002 (US). NASIATKA, Jim; 553 DuBoce Avenue #8, San Francisco, CA 94117 (US).

(74) Agents: RAFA, Michael, J. et al.; Inhale Therapeutic Systems, Inc., 150 Industrial Road, San Carlos, CA 94070 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

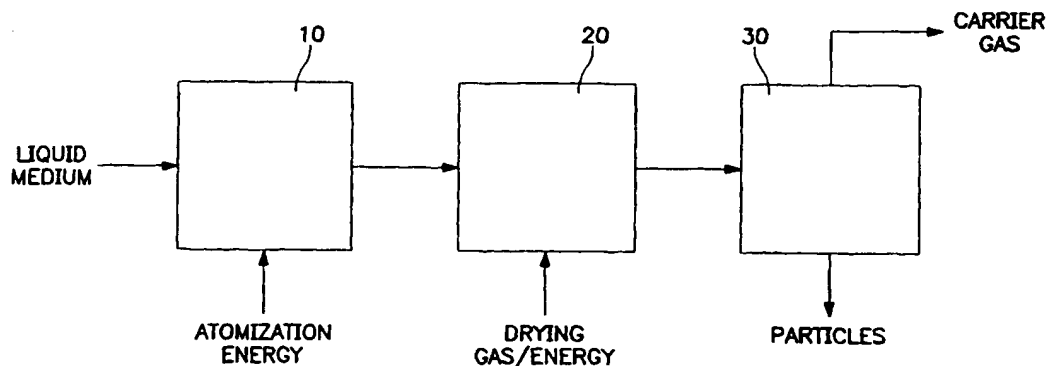
Published:

with international search report

(88) Date of publication of the international search report:  
30 May 2002

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: APPARATUS AND PROCESS TO PRODUCE PARTICLES HAVING A NARROW SIZE DISTRIBUTION AND PARTICLES MADE THEREBY



(57) Abstract: The present invention is directed to particles, including liquid droplets and dry particulates, having a narrow particle size distribution made from a liquid feed stock. In particular, the invention is directed to producing particles of a desired median diameter and narrow particle size distribution without the need for additional separation processing. The process of the present invention can be tailored to produce substantially monodisperse particles or multimodal particles having well defined and controllable particle size distributions. The present invention is particularly well suited for producing particles for pulmonary administration.

WO 02/09669 A3

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/23937

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A61K9/16 A61K9/00

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ, EPO-Internal, CHEM ABS Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category * | Citation of document, with indication, where appropriate, of the relevant passages                   | Relevant to claim No. |
|------------|--|-----------------------|
| X          | US 6 051 257 A (TOIVO T. KODAS, ET AL.)<br>18 April 2000 (2000-04-18)<br>the whole document<br>----- | 1-31                  |

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*G\* document member of the same patent family

Date of the actual completion of the international search

18 February 2002

Date of mailing of the international search report

26/02/2002

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.  
Fax: (+31-70) 340-3016

Authorized officer

Ventura Amat, A